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A PARTIAL REVISION OF SCHIZOMIDA (ARACHNIDA), WITH DESCRIPTIONS OF NEW SPECIES, GENUS, AND FAMILY

J. MARK ROWLAND

Collections made by members of The Museum, Texas Tech University, and The Association for Mexican Cave Studies during extensive field activities carried out in southern Mexico over the last few years have greatly improved our knowledge of schizomids and other groups. This is the fifth report in a series (Rowland, 1971*a*, 1971*b*, 1973*a*, 1973*b*) that treats the schizomids provided by these sources.

Further studies of the world fauna have revealed important data that necessitate a reevaluation of certain taxa. These basic changes will be elaborated upon in my future revision of the world fauna. In amending my earlier classification (1973*c*), I have removed the genus *Agastoschizomus* from the subfamily Megaschizominae and placed its species into two genera. The newly created genus is then used as the type of the new family. The Megaschizominae is still recognized as a subfamily within the Schizomidae, but is now monotypic, containing only its nominate and type genus, *Megaschizomus.*

PROTOSCHIZOMIDAE, new family

Description.—Cephalothorax. Carapace (propeltidium) without eye spots; mesopeltidia large, separated by about one-third to one-tenth their greatest dimension; metapeltidia entire or divided.

Abdomen. With eight paris of dorsoventral muscles.

Flagellum. Segmented in females.

Chelicerae. Serrula absent, but represented by a row of blunt, nearly hemispherical knobs; no row of closely situated setae at base of fixed digit. Two teeth on fixed digit, basal one arising at an angle from ventral surface of basal segment.

Pedipalps. Ratio of claw length to dorsal length of basitarsus 1:1.5 or 1:1; basitarsal spurs symmetrically placed, long, about one-third to one-half dorsal length of basitarsus; true spines present.

Legs. Fourth trochanter about 2.2 times longer than wide; fourth femur from about three to five times longer than deep.

Etymology.—The family name is taken from the type genus described below.

Type genus.—The type genus is described as follows:

Protoschizomus, new genus

Description.—A small species, total length of adults from five to six millimeters.

Cephalothorax. Mesopeltidial plates separated by one-third their length; greatest length to greatest width ratio of metapeltidial plates about 1.3:1.

Abdomen. Sterna IV through VII about six times wider than long.

Pedipalps. Claw shorter than dorsal length of basitarsus, ratio of about 1:1.5; basitarsal spurs about one-third dorsal length of basitarsus.

Legs. Femur of fourth leg about three times longer than deep.

Etymology.—The generic name is masculine and is taken from Greek *proto*, meaning first, original, or primitive, and *schizomus* from the genus *Schizomus*.

Type species.—The type species of this genus is here designated as *Agastoschizomus pachypalpus* Rowland, 1973.

Remarks.—The new genus here designated is proposed to receive two species. The first of these, the type, and another new species described below are the first of what will probably prove to be a widespread group of American species. The two protoschizomid genera, *Protoschizomus* and *Agastoschizomus*, have been delineated because their members seemingly compose discrete phyletic units, typified by marked morphological differences.

The recent discovery of the male of *P. pachypalpus* allows me to provide its description. It was previously known only from females.

Distribution.—This genus, as here described, is represented by two species, one from Tamaulipas, the other from Colima, México.

Protoschizomus pachypalpus (Rowland)

1973. *Agastoschizomus pachypalpus* Rowland, Occas. Papers Mus., Texas Tech Univ., 11:8.

Male.—An adult, taken 51.5 mi. E Ciudad Victoria, Tamaulipas, México, on highway 70, on 17 October 1972, by B. L. Firstman and

V. D. Roth, and deposited in the American Museum of Natural History, New York City.

Description.—The following describes the male.

Cephalothorax. Carapace with five pairs of dorsal and two apical setae, less than twice as long as wide, gently convex, lateral margins recurved inward, nearly vertical, produced anteromesally as a basally blunt conical process; eye spots absent; mesopeltidia long, acutely triangular, not curved, pointing diagonally toward midline; metapeltidium divided medially into two plates, medial margin of plates shorter than curving lateral margins, anterior margin closely parallel with posterior margin of mesopeltidia, but slightly divergent medially, posterolateral margin of metapeltidial plates associated with small narrowly curved plate; anterior sternum with 11 setae, triangular, apex extending just to caudal limit of coxae II, anterolateral margins gently curved; posterior sternum with four setae, triangular.

Abdomen. First abdominal tergum located closer to second abdominal segment than to metapeltidium, chevron shaped; terga I to II with two setae, III to VII with four setae, VIII with 10 setae, IX with four setae; segment X with 13 setae; segment XI with 13 setae; and segment XII with two dorsal, four lateral, nine ventral setae; lung books not visible under second abdominal sternum; terga III to VIII bearing slightly darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII.

Flagellum. Long, club shaped, expanded distally, bearing 22 major setae.

Pedipalps. Trochanter not produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; basitarsus with two long spurs just above claw; all segments robust; lengths of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, $7 > 1 > 2, 3, 4, 5, 6$; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 80 per cent as long as tibia; length of segments given in Table 1.

Comparison.—See account of *P. occidentalis* and Figs. 1-2.

Measurements.—Total length of the male described above is 5.0 millimeters.

Variation.—Only one male of this species was available for study.

Distribution.—Several collections of schizomids, all perhaps referable to this species, have recently come to my attention. The following is a complete list of all collections known to me. TAMAULIPAS: 2 females, 1 immature (holotype and paratypes), Nacimiento del Río Frío, 3 mi. S Gómez Farías, 12 March 1969, J. R. Reddell,

AMNH; 1 female (paratype), Gómez Farías, 6 January 1964, J. R. Reddell, D. McKenzie, L. Manire, AMNH; 1 female (paratype), Arroyo Nacimiento del Río Frío, near Gómez Farías, 16 February 1970, R. W. Mitchell, AMNH; 2 females, 1 immature, 60 mi. S Ciudad Victoria, *ex* bromeliads, 17 November 1948, H. B. Leech, CAS; 1 male, 1 subadult female, 51.5 mi. E Ciudad Victoria on highway 70, 17 October 1972, B. L. Firstman, V. D. Roth, AMNH.

Protoschizomus occidentalis, new species
Fig. 1

Holotype.—An adult male, taken under a rock, 13 mi. SW Colima, Colima, México, on 16 July 1972, by A. Jung, and deposited in the American Museum of Natural History, New York City.

Paratype.—A subadult female, taken at the same locality, by the same collector, on the same date as the holotype, and also deposited in the American Museum of Natural History.

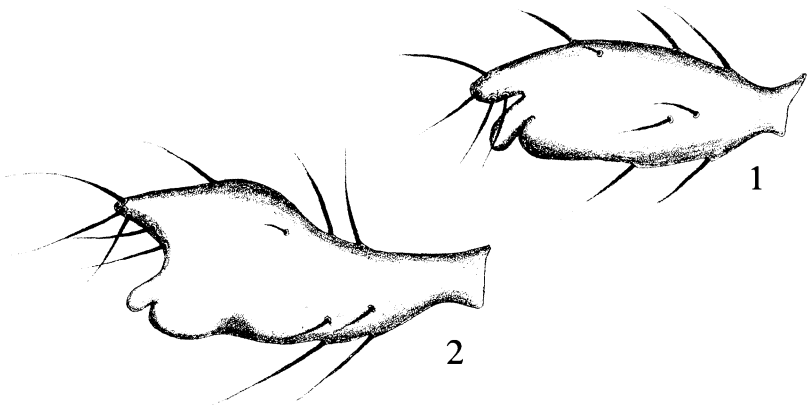
Description.—The following describes the male.

Cephalothorax. Carapace with four pairs of dorsal and two apical setae, less than twice as long as wide, gently convex, lateral margins recurved inward, nearly vertical, produced anteromesally as a basally blunt, conical process; eye spots absent from anterolateral surface of carapace; mesopeltidia long, acutely triangular, not curved, pointing diagonally toward midline; metapeltidium divided medially into two plates, medial margins of plates shorter than curving lateral margins, anterior margin closely parallel with posterior margin of mesopeltidia, but slightly divergent medially, posterolateral margin of metapeltidial plates associated with small, narrowly curved plate; anterior sternum with 11 setae, triangular, apex extending just to caudal limit of coxae II, anterolateral margins gently curved; posterior sternum with four setae, triangular.

Abdomen. First abdominal tergum located closer to second abdominal segment than to metapeltidium, chevron shaped; terga I to II with two setae, III to VII with four setae, VIII to IX with six setae; segment X with nine setae; segment XI with nine setae; and segment XII with two dorsal and 13 lateral and ventral setae; lung books not visible under second abdominal sternum; terga III to VIII bearing slightly darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as darkened areas on sterna V to VII.

Flagellum. Long, club shaped, expanded distally, bearing 22 major setae.

Pedipalps. Trochanter not produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, sub-



FIGS. 1-2.—Lateral view of male flagella: 1, *Protoschizomus occidentalis*; 2, *P. pachypalpus*. Scale, one centimeter = .12 millimeter.

apical spur; tarsus-basitarsus with two long spurs just above claw; all segments robust; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions, 7 > 1 > 2, 3, 4, 5, 6; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 80 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—The two species of this genus can be separated most easily by comparison of the males' flagella, the distal expansion of which is greater in *P. pachypalpus* than in *P. occidentalis* (see Figs. 1-2). Also, the carapace of *P. pachypalpus* has five pairs of paramedial setae, whereas *P. occidentalis* has four pairs, and the eighth abdominal tergum of the former species has 10 setae, as opposed to only six found in the latter. Other minor setational differences exist.

Measurements.—The total length of the holotype is 4.9. See also Table 1.

Variation.—Only one adult of this species was available for study.

Distribution.—*P. occidentalis* is known only from the type locality, 13 mi. SW Colima, Colima, México.

Etymology.—The specific name is taken from Latin *occidentalis*, meaning situated in the west.

Agastoschizomus Rowland

1971. *Agastoschizomus* Rowland, Assoc. Mexican Cave Studies Bull., 4:13.
1973. *Agastoschizomus*, Rowland, J. New York Entomol. Soc., 80:202.

Redescription.—Large species, total length of adults from 8 to 15 millimeters.

TABLE 1.—*Selected measurements of* Protoschizomus pachypalpus *(male),* Protoschizomus occidentalis *(holotype),* Agastoschizomus huitzmolotitlensis *(holotype),* Schizomus trilobatus *(holotype),* Schizomus trilobatus *(allotype),* Schizomus pallidus *(holotype),* Schizomus pallidus *(allotype),* Schizomus lanceolatus *(holotype),* Schizomus lacandonus *(holotype),* Schizomus infernalis *(holotype), and* Schizomus infernalis *(allotype).*

Variate	Pedipalp	Legs			
		I	II	III	IV
		Protoschizomus pachypalpus (male)			
Coxa	.59	.48	.45	.40	.36
Trochanter	.46	.39	.19	.20	.55
Femur	.79	.97	.80	.71	1.05
Patella	.81	1.06	.44	.34	.52
Tibia	.68	.95	.53	.37	.77
Basitarsus			.38	.43	.63
	.30	.89			
Tarsus			.40	.42	.47
		Protoschizomus occidentalis (holotype)			
Coxa	.50	.44	.40	.35	.33
Trochanter	.36	.37	.18	.21	.48
Femur	.77	1.02	.80	.74	.99
Patella	.76	1.07	.48	.38	.54
Tibia	.76	.98	.48	.36	.70
Basitarsus			.35	.41	
	.29	.83			
Tarsus			.37	.35	
		Agastoschizomus huitzmolotitlensis (holotype)			
Coxa	.85	.65	.68	.65	.55
Trochanter	.65	.66	.38	.45	1.01
Femur	.99	2.53	1.83	1.88	2.24
Patella	.85	3.11	1.05	.96	1.15
Tibia	.91	2.50	1.35	1.24	1.90
Basitarsus			.87	1.04	1.42
	.39	1.54			
Tarsus			.80	.82	.95
		Schizomus trilobatus (holotype)			
Coxa	.46	.65	.40	.27	.29
Trochanter	.41	.40	.20	.17	.33
Femur	.40	1.50	.83	.64	1.29
Patella	.45	2.02	.45	.26	.55
Tibia	.36	1.52	.55	.37	.91
Basitarsus			.54	.48	.79
	.23	.91			
Tarsus			.37	.39	.48

TABLE 1.—*Continued.*

		Schizomus trilobatus (allotype)			
Coxa	.42	.51	.36	.31	.27
Trochanter	.34	.28	.17	.20	.30
Femur	.41	1.03	.68	.62	1.02
Patella	.39	1.26	.41	.30	.48
Tibia	.33	.91	.42	.31	.70
Basitarsus			.41	.40	.61
	.19	.71			
Tarsus			.32	.33	.37
		Schizomus pallidus (holotype)			
Coxa	.60	.68	.46	.38	.35
Trochanter	.47	.38	.23	.21	.34
Femur	.52	1.86	1.07	.97	1.50
Patella	.55	2.12	.52	.61	1.19
Tibia	.46	1.53	.80	.78	1.09
Basitarsus			.55	.63	.93
	.25	1.20			
Tarsus			.48	.50	.64
		Schizomus pallidus (allotype)			
Coxa	.69	.71	.51	.43	.38
Trochanter	.62	.40	.25	.27	.38
Femur	.60	1.73	1.15	1.06	.81
Patella	.64	2.08	.63	.45	.62
Tibia	.58	1.60	.80	.62	1.21
Basitarsus			.62	.68	1.00
	.27	1.11			
Tarsus			.51	.53	.63
		Schizomus lanceolatus (holotype)			
Coxa	.73	.78	.52	.42	.41
Trochanter	.56	.44	.27	.25	.35
Femur	.64	1.80	1.15	1.01	1.51
Patella	.69	2.34	.55	.50	.65
Tibia	.54	1.79	.82	.57	1.07
Basitarsus			.67	.71	.92
	.25	1.26			
Tarsus			.55	.55	.65
		Schizomus lacandonus (holotype)			
Coxa	.50	.76	.42	.38	.35
Trochanter	.52	.43	.21	.16	.39
Femur	.50	1.73	.90	.76	1.49
Patella	.52	2.31	.50	.36	.62
Tibia	.45	1.81	.64	.45	1.07
Basitarsus			.53	.55	.89
	.23	1.08			
Tarsus			.41	.37	.52

TABLE 1.—*Continued.*

		Schizomus infernalis (holotype)			
Coxa	.55	.54	.39	.32	.27
Trochanter	.80	.26	.20	.20	.29
Femur	.90	1.05	.74	.65	1.04
Patella	.96	1.30	.43	.29	.51
Tibia	.54	.95	.44	.27	.69
Basitarsus			.41	.42	.60
	.23	.78			
Tarsus			.35	.35	.42
		Schizomus infernalis (allotype)			
Coxa	.50	.49	.35	.31	.26
Trochanter	.46	.27	.16	.15	.26
Femur	.50	.86	.63	.58	.92
Patella	.46	1.04	.35	.25	.41
Tibia	.36	.78	.41	.29	.60
Basitarsus			.35	.34	.50
	.19	.73			
Tarsus			.29	.30	.41

Cephalothorax. Mesopeltidial plates separated by one-tenth their greatest dimension; greatest length to greatest width ratio of metapeltidial plates about 1:1.

Abdomen. Sterna IV through VII about three times wider than long.

Pedipalps. Claw longer than dorsal length of basitarsus, ratio of about 1.1:1; basitarsal spurs about one-half dorsal length of basitarsus.

Legs. Femur of fourth leg about five times longer than deep.

Type species.—*Agastoschizomus lucifer* Rowland, 1971, by original designation.

Agastoschizomus huitzmolotitlensis, new species

Fig. 3

Holotype.—An adult male, taken in Sótano de Huitzmolotitla, 2 km. SW Tlamaya, and approximately 10 km. N Xilitla, San Luis Potosí, México, on 24 January 1964, by Terry Raines and Tommy Phillips in mud room 9000 feet from entrance of cave, and deposited in the American Museum of Natural History.

Description.—The following is descriptive of males only, females being unknown.

Cephalothorax. Carapace with one pair of dorsal and three apical setae, more than twice as long as wide, gently convex, lateral margins diagonal, produced anteromesally as a sharp, conical process; eye spots absent; mesopeltidia acutely triangular, straight, pointing diag-

onally toward midline; metapeltidium undivided, slightly emarginate posteriorly, not as deep medially as laterally, anterior margin closely parallel with posterior margin of mesopeltidium; anterior sternum with 11 setae, triangular, apex extending just beyond caudal limit of coxae II, anterolateral margins gently curved; posterior sternum with one seta, triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than to second abdominal tergum, chevron shaped; terga I to IV with two setae, terga V to VII with four setae, terga VIII and IX with 10 and six setae, respectively; spiracles narrow slits on second abdominal sternum; terga III to VIII bearing apodemes of dorsoventral muscles; vestigial stigmata appearing as weakly darkened areas on sterna V to VII.

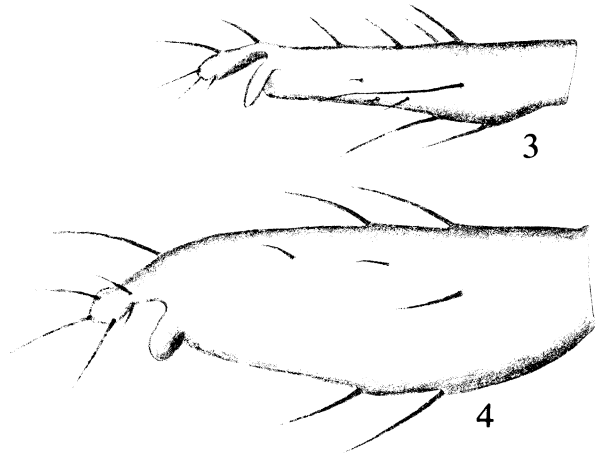
Flagellum. Long, cylindrical, bearing 18 major setae; apically modified.

Chelicerae. Lateral aspect of basal segment bearing 17 setae, vertical group of two long, setae flanking movable finger (second cheliceral segment), group of three setae arranged basally on fixed digit, horizontal group of 12 setae arising on or near ventral margin; mesal surface of basal segment bearing two setae arranged vertically, lower group of eight setae arranged diagonally, movable finger flanked by another diagonal group of three long setae as on lateral surface, three large, elongate setae originating in membrane just below movable finger, fixed digit bearing no feathered setae; movable finger laterally destitute of setae, mesal aspect bearing vertical row of 11 long, feathered, distally curled setae near outer margin, another vertical row of seven short knobs or teeth near inner surface.

Pedipalps. Trochanter not distinctly produced distally; femur and patella narrow proximally, expanded distally, bearing several stout spines; tibia without mesal, subapical spur; tarsus-basitarsus with two large spurs just above claw; length of segments given in Table 1.

Legs. Basitarsal-tarsal segments of leg I of the following proportions: $1 > 7 > 2, 3, 4, 5, 6$; anterolateral spur of coxa II 15 per cent as long as coxa proper; patella of leg III 65 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—A. huitzmolotitlensis is the second species of a remarkable group of schizomids. Its closest known relative is *A. lucifer* Rowland, 1971 (see Figs. 3-4), known from caves in another mountain range about 50 miles to the north. This new species is smaller and displays more advanced troglobitic facies, such as the relative elongation of limbs. The flagellum, in particular, is much narrower. The latter, although perhaps not directly related to cave adaptation, serves best to distinguish the two species of this genus.



FIGS. 3-4.—Lateral view of male flagella: 3, *Agastoschizomus huitzmolotitlensis*; 4, *A. lucifer*. Scale, one centimeter = .16 millimeter.

Measurements.—Total length of holotype, 8.2. See also Table 1.

Variation.—Only one specimen of this species was available for study.

Distribution.—*A. huitzmolotitlensis* is known only from Sótano de Huitzmolotitla, 2 km. SW Tlamaya, and 10 km. N Xilitla, San Luis Potosí, México.

Etymology.—The specific name is taken from Sótano de Huitzmolotitla.

Family SCHIZOMIDAE Hansen and Sorensen

1872. Tartarides Cambridge, Ann. Mag. Nat. Hist., ser. 4, 10:410.
1888. Schizonotidae Thorell, Ann. Mus. Civ. Genova, 26:358.
1897. Schizonotidae, Kraepelin, Abhand. Geb. Naturw. Verein Hamburg, 15:50.
1899. Schizonotidae, Kraepelin, Scorp. und Pedip., *in* Das Tierreich, 8:233.
1899. Hubbardiidae Cook, Proc. Biol. Soc. Washington, 4:249.
1905. Schizomidae Hansen and Sorensen, Arkansas Zool., 2:4.
1915. Schizomidae, Gravely, Rec. Indian Mus., 11:516.
1922. Schizomidae, Chamberlin, Proc. Biol. Soc. Washington, 35:11.
1955. Schizomidae, Petrunkevitch, Arachnida, *in* Treatise on Invertebrate Paleontology, Geol. Soc. Amer., P, Arthropoda, 2:123.
1973. Schizomidae, Rowland, J. New York Entomol. Soc., 80:200.

Redescription.—Cephalothorax. Carapace with or without eye spots, mesopeltidia small, separated by about one-half to two-thirds their greatest dimension; metapeltidium entire or divided.

Abdomen. With seven pairs of dorsoventral muscles.

Flagellum. Segmented or unsegmented in females.

Chelicerae. Serrula present, a row of closely situated setae also present at base of fixed digit. Three or five to nine teeth present on fixed digit, basal one arising gradually from ventral surface of basal segment.

Pedipalps. Ratio of claw length to dorsal basitarsal length from about 1:4 to 1:1.2; basitarsal spurs symmetrically placed, medium to short, about one-fourth to one-fifth dorsal length of basitarsus; true spines present or absent.

Legs. Fourth trochanter about 1.4 or 2.2 times longer than wide, fourth femur from about 2.6 to 4.1 times longer than deep.

Subfamily SCHIZOMINAE Hansen and Sorensen

1905. Schizomidae, Hansen and Sorensen, Arkansas Zool., 2:4.
1973. Schizominae, Rowland, J. New York Entomol. Soc., 80:200.

Redescription.—Cephalothorax. Carapace with or without eye spots; mesopeltidia divided by about equal to their greatest dimension; metapeltidium entire or divided.

Flagellum. Unsegmented in females.

Chelicerae. Five to nine teeth on the fixed digit.

Pedipalps. Ratio of claw length to dorsal basitarsal length about 1:4 to 1:1.2; basitarsal spurs asymmetrically placed, short, about one-fifth dorsal length of basitarsus; true spines absent.

Legs. Fourth trochanter about 1.4 times longer than wide, fourth femur about 2.6 times longer than deep.

Schizomus trilobatus, new species

Fig. 5

Holotype.—An adult male, taken in Las Grutas del Coconá, Tabasco, México, on 24 July 1973, by J. M. Rowland and J. R. Reddell, and deposited in The Museum, Texas Tech University, Lubbock.

Allotype.—An adult female, taken at the same locality, on the same date, by the same collectors as was the holotype, and also deposited in The Museum, Texas Tech University.

Paratypes.—An adult male and five adult females, taken at the same locality, on the same date, by the same collectors as was the holotype, and deposited in the American Museum of Natural History.

Description.—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace with three pairs of dorsal and two apical setae, less than twice as long as wide, extremely convex, lateral

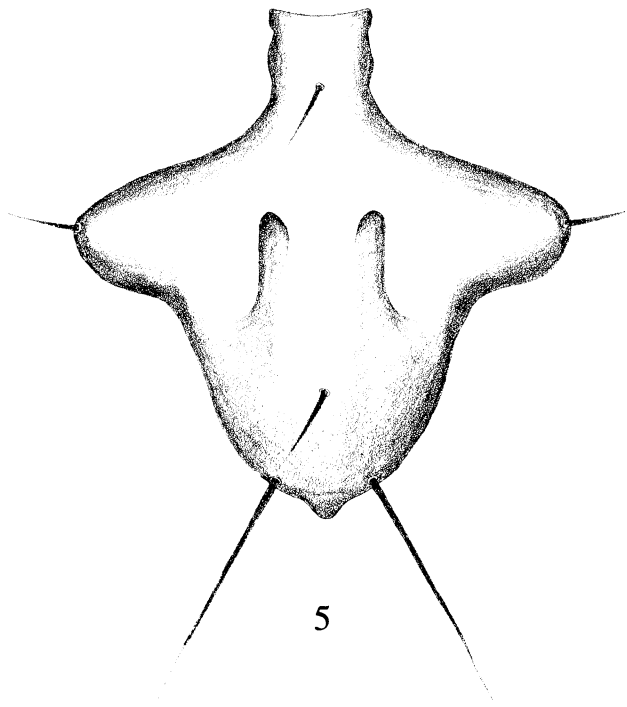


FIG. 5.—Dorsal view of male flagellum of *Schizomus trilobatus*. Scale, one centimeter = .06 millimeter.

margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots distinctly oval, pale areas on anterolateral surface of carapace; mesopeltidia acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium undivided, slightly emarginate posteriorly, not as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidia; anterior sternum with nine setae, triangular, apex extending well beyond caudal limit of coxa II, anterolateral margins gently curved; posterior sternum with six setae, vaguely triangular.

Abdomen. First abdominal tergum located much closer to metapeltidium than to second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, six lateral, and five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing vaguely darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as oval, darkened areas on sterna V to VII.

Flagellum. Trilobate, horizontally compressed, bearing 16 setae; dorsal surface with two deep depressions, each with lateral swellings (Fig. 5).

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions $1>7>6>3>2>4$, 5; anterolateral spur of coxa of leg II 35 per cent as long as coxa proper; patella of leg III 90 per cent as long as tibia; length of segments given in Table 1.

Females differ from males in the following respects: First legs proportionately much shorter than in male, length of segments given in Table 1; flagellum long, rod shaped, with two annulations, the terminal section longer than previous two; abdominal sternum II strongly emarginate posteriorly.

Comparisons.—*S. trilobatus* is closely related to *S. moisii* Rowland, 1973, and *S. stewarti* Rowland, 1973. The latter two species, however, have club-shaped flagella, whereas *S. trilobatus* has a distinctively trilobed flagellum.

Measurements.—The total length of the male holotype and the female allotype, both from the type locality, is 4.1 and 3.7, respectively. See also Table 1.

Variation.—No variation disproportionate to that in total length was noticed.

Distribution.—*S. trilobatus* is known only from Las Grutas del Coconá, Tabasco, México. This species was collected in the twilight zone of this cave and no doubt represents an invader from outside the cave environment.

Etymology.—The specific name is a combination from the Latin words *tri*, meaning three, and *lobus*, meaning lobe, describing the morphology of the male's flagellum.

Schizomus pallidus, new species
Fig. 6

Holotype.—An adult male, taken in Cueva Macinga, Tlilapan, Veracruz, México, on 5 March 1973, by J. Reddell, and deposited in The Museum, Texas Tech University.

Allotype.—An adult female, taken at the same locality, on the same date by the same collector as was the holotype, and also deposited in The Museum, Texas Tech University.

Paratypes.—An adult male and adult female, taken at the same locality, on the same date, by the same collector as were the holotype and allotype, and deposited in the American Museum of Natural History.

Description.—The following, except for the last paragraph under this heading, describes the male.

Cephalothorax. Carapace with three pairs of dorsal and two apical setae, less than twice as long as wide, acutely convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots present; mesopeltidia acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium undivided, emarginate posteriorly, not as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidia; anterior sternum with 11 setae, triangular, apex extending just beyond caudal limit of coxa II, anterolateral margins gently curved; posterior sternum with six setae, vaguely triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than to second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, six lateral, and five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing vaguely visible apodemes of dorsoventral muscles; vestigial stigmata appearing as darkened areas on sterna V to VII.

Flagellum. Spade shaped, horizontally compressed, bearing 16 setae; dorsal surface with two deep lateral depressions (Fig. 6).

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions $1>7>3$, $6>4$, $5>2$; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 40 per cent as long as tibia; length of segments given in Table 1.

Females differ from males in the following respects: First legs proportionately shorter than in males; lengths of segments given in Table 1. Flagellum long, rod shaped, with two annulations, the terminal section longer than previous two; abdominal sternum II strongly emarginate posteriorly.

Comparisons.—*S. pallidus* seems to be a member of the *mexicanus-longimanus* complex based on the morphology of the male's flagellum. The dorsal setation of the carapace of this troglobite, however, is

different from the above group. Both *S. mexicanus* and *S. longimanus* are characterized by having two pairs of dorsal setae, whereas *S. pallidus* has three paris of dorsal setae.

Measurements.—The total length of the male holotype and the female allotype, both from the type locality, is 5.5 and 5.8, respectively. See also Table 1.

Variation.—No variation disproportionate to that in total length was noticed.

Distribution.—*S. pallidus* is known only from Cueva Macinga, Tlilapan, Veracruz, México.

Etymology.—*Pallidus* is a Latin word meaning pale, describing the color of this species.

Schizomus lanceolatus, new species
Fig. 7

Holotype.—An adult male, taken in Cueva del Diablo, Veracruz, México, on 7 March 1973, by J. Reddell, and deposited in The Museum, Texas Tech University.

Description.—The following describes the male.

Cephalothorax. Carapace with three pairs of dorsal and two apical setae, twice as long as wide, acutely convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots vaguely triangular, pale areas on anterolateral surface of carapace; mesopeltidia acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium undivided, emarginate posteriorly, not as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidia; anterior sternum with 13 setae, triangular, apex extending just beyond caudal limit of coxa II, anterolateral margins gently curved; posterior sternum with six setae, vaguely triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than to second abdominal tergum, triangular; terga II to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, six lateral, and five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing visible apodemes of dorsoventral muscles; vestigial stigmata appearing as darkened areas on sterna V to VII.

Flagellum. Lanceolate, horizontally compressed, bearing 16 setae; dorsal surface with two, small, lateral depressions (Fig. 7).

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, sub-

apical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions 1 > 7 > 4 > 3, 5, 6 > 2; anterolateral spur of coxa of leg II 30 per cent as long as coxa proper; patella of leg III 65 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—*S. lanceolatus* appears to have its closest affinities with *S. orthoplax* Rowland, 1973. The flagella of the males are both extremely elongate and flat, with two depressions located about the same place on the dorsal surface. *S. lanceolatus* is much larger than *S. orthoplax*, and has three pairs of setae on the carapace, whereas the latter has only two.

Measurements.—The total length of the male holotype is 6.1. See also Table 1.

Variation.—Only one specimen of this species was available for study.

Distribution.—*S. lanceolatus* is known only from Cueva del Diablo, Veracruz, México.

Etymology.—*Lanceolatus* is a Latin word meaning a little lance, which describes the morphology of the male's flagellum.

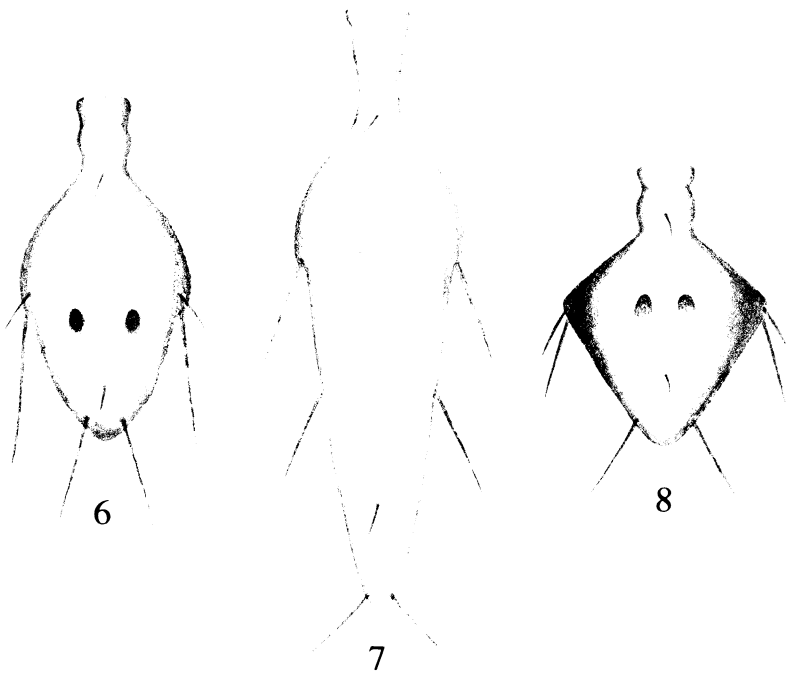
Schizomus lacandonus, new species
Fig. 8

Holotype.—An adult male, taken at Ruinas de Palenque, Chiapas, México, on 25 July 1973, by J. M. Rowland and J. R. Reddell, and deposited in The Museum, Texas Tech University.

Description.—The following is descriptive of males only, females being unknown.

Cephalothorax. Carapace with three pairs of dorsal and two apical setae, twice as long as wide, extremely convex, lateral margins nearly vertical, produced anteromesally as a blunt, conical process; eye spots distinct; mesopeltidia acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium undivided, deeply emarginate posteriorly, not nearly as deep medially as laterally, anterior margin closely parallel with posterior margin of mesopeltidia; anterior sternum with nine setae, triangular, apex extending well beyond caudal limit of coxa II, anterolateral margin gently curved; posterior sternum with six setae, vaguely triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than to second abdominal tergum, chevron shaped; terga I to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with eight setae; segment XII with two dorsal, six



FIGS. 6-8.—Dorsal view of male flagella: 6, *Schizomus pallidus*; 7, *S. lanceolatus*; 8, *S. lacandonus*. Scale, one centimeter = .06 millimeter.

lateral, and six ventral setae; spiracles oval, inlets on second abdominal sternum; terga III to VII bearing vaguely distinguishable apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII.

Flagellum. Club shaped, dorsally compressed, bearing 16 setae and two dorsal, paramedial pits (Fig. 8).

Pedipalps. Trochanter distinctly produced distally; femur and patella narrow proximally, expanded distally; tibia without mesal, subapical spur; tarsus-basitarsus with two small spurs just above claw; length of segments given in Table 1.

Legs. Tarsal segments of leg I of the following proportions $1 > 7 > 2, 3, 4, 5, 6$; anterolateral spur of coxa of leg II 50 per cent as long as coxa proper; patella of leg III 75 per cent as long as tibia; length of segments given in Table 1.

Comparisons.—This species can be distinguished by the morphology of the male's flagellum, which is similar in form to that of *S. longimanus* Rowland, 1971. The flagellum of *S. lacandonus* is larger, and thicker, however. This species also has three pairs of dorsal, carapacal setae, whereas *S. longimanus* has two pairs.

Measurements.—Total length of holotype, 4.5. See also Table 1.

Variation.—Only one specimen of this species was available for study.

Distribution.—*S. lacandonus* is known only from Ruinas de Palenque, Chiapas, México.

Etymology.—The specific name is taken from Lacandona, the name of the Indian inhabitants of this area.

Schizomus infernalis, new species
Figs. 9-10

Holotype.—An adult male, taken 0.8 km. N Ruinas de Palenque, Chiapas, México, on 25 July 1973, from Berlese samples, by R. W. Mitchell and J. R. Reddell, and deposited in The Museum, Texas Tech University.

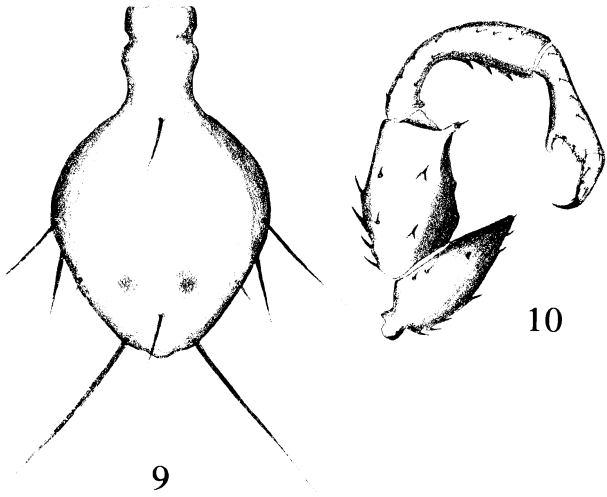
Allotype.—An adult female, taken at the same locality, on the same date, by the same collectors as was the holotype, and also deposited in The Museum, Texas Tech University.

Paratypes.—An adult male and three adult females, taken at the same locality, on the same date, by the same collectiors as were the holotype and allotype, and deposited in the American Museum of Natural History.

Description.—The following, except for the last paragraph under this heading, is descriptive of males.

Cephalothorax. Carapace with two pairs of dorsal and two apical setae, less than twice as long as wide, broadly convex, lateral margins nearly diagonal, produced anteromesally as a sharp, conical process; eye spots with irregular, circular margin; mesopeltidia acutely triangular, vaguely curved, pointing diagonally toward midline; metapeltidium undivided, emarginate posteriorly, not as deep medially as laterally, anterior margin parallel with posterior margin of mesopeltidia; anterior sternum with 13 setae, triangular, apex extending well beyond caudal limit of coxae II, anterolateral margin gently curved; posterior sternum with six setae, vaguely triangular.

Abdomen. First abdominal tergum located closer to metapeltidium than to second abdominal tergum, chevron shaped; tergum II with four setae, III to VII with two setae, terga VIII and IX with four setae; segment X with seven setae; segment XI with seven setae; segment XII with two dorsal, six lateral, and five ventral setae; spiracles oval on second abdominal sternum; terga III to VII bearing slightly darkened apodemes of dorsoventral muscles; vestigial stigmata appearing as slightly darkened areas on sterna V to VII.



FIGS. 9-10.—Flagellum and pedipalp of *Schizomus infernalis*: 9, dorsal view of male flagellum; 10, lateral view of male pedipalp. Scale for flagellum, one centimeter = .06 millimeter. Scale for pedipalp, one centimeter = .32 millimeter.

Flagellum. Spade shaped, horizontally compressed, bearing 16 setae; dorsal surface without relief (Fig. 9).

Pedipalps. Trochanter very long, distinctly produced distally; femur greatly thickened, with one mesal and two lateral teeth; patella narrow proximally, curved downward, and greatly expanded distally; tibia with mesal, subapical, curved spur; tarsus-basitarsus with two symmetrical spurs just above claw; length of segments given in Table 1 (see also Fig. 10).

Legs. Tarsal segments of leg I of the following proportions $1>7>5>3$, $4>6>2$; anterolateral spur of coxa of leg II 25 per cent as long as coxa proper; patella of leg III 90 per cent as long as tibia; lengths of segments given in Table 1.

Females differ from males in the following respects: First legs proportionately shorter than in male; lengths of segments given in Table 1. Flagellum long, rod shaped, with two annulations, the terminal section longer than the previous two; pedipalps not modified as in males.

Comparisons.—This species is closely related to *S. mexicanus* Rowland, 1971, and *S. longimanus* Rowland, 1971. The shape of the male's flagellum is similar to the above species, but there is no dorsal relief in *S. infernalis*. In the latter respect *S. infernalis* is similar to *S. lukensi* Rowland, 1973, but the setation of the cephalothorax is much different. There are two pairs of dorsal and two apical setae in

S. mexicanus, *S. longimanus*, and *S. infernalis*; but *S. lukensi* has three pairs of dorsal and two apical setae. The pedipalps of *S. infernalis* males are quite unlike any other schizomids.

Measurements.—The total length of the male holotype and the female allotype, both from the type locality, is 4.0 and 4.2, respectively. See also Table 1.

Variation.—No variation disproportionate to that in body length was noticed.

Distribution.—*S. infernalis* is known only from 0.8 km. N Ruinas de Palenque, Chiapas, México.

Etymology.—*Infernalis* is a Latin word meaning satanic, or diabolical, which is inspired by the modified pedipalps of the male.

Subfamily MEGASCHIZOMINAE Rowland

1973. Megaschizominae Rowland, J. New York Entomol. Soc., 80:202.

Redescription.—Cephalothorax. Carapace with eye spots; mesopeltidia separated by about two-thirds their greatest dimension; metapeltidium entire.

Flagellum. Segmented in females.

Chelicerae. Three teeth on fixed digit.

Pedipalps. Ratio of claw length to dorsal basitarsal length about 1:2; basitarsal spurs symmetrically placed, medium sized, about one-fourth dorsal length of basitarsus; true spines present.

Legs. Fourth trochanter about 2.2 times longer than wide, fourth femur about 4.1 times longer than deep.

Type genus.—*Megaschizomus* Lawrence, 1969.

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Addresses of author: *The Museum and Department of Biological Sciences, Texas Tech University, Lubbock, 79409.* *Received 28 May, accepted 27 August 1974.*